Fig 1. Open Loop Table based AGC
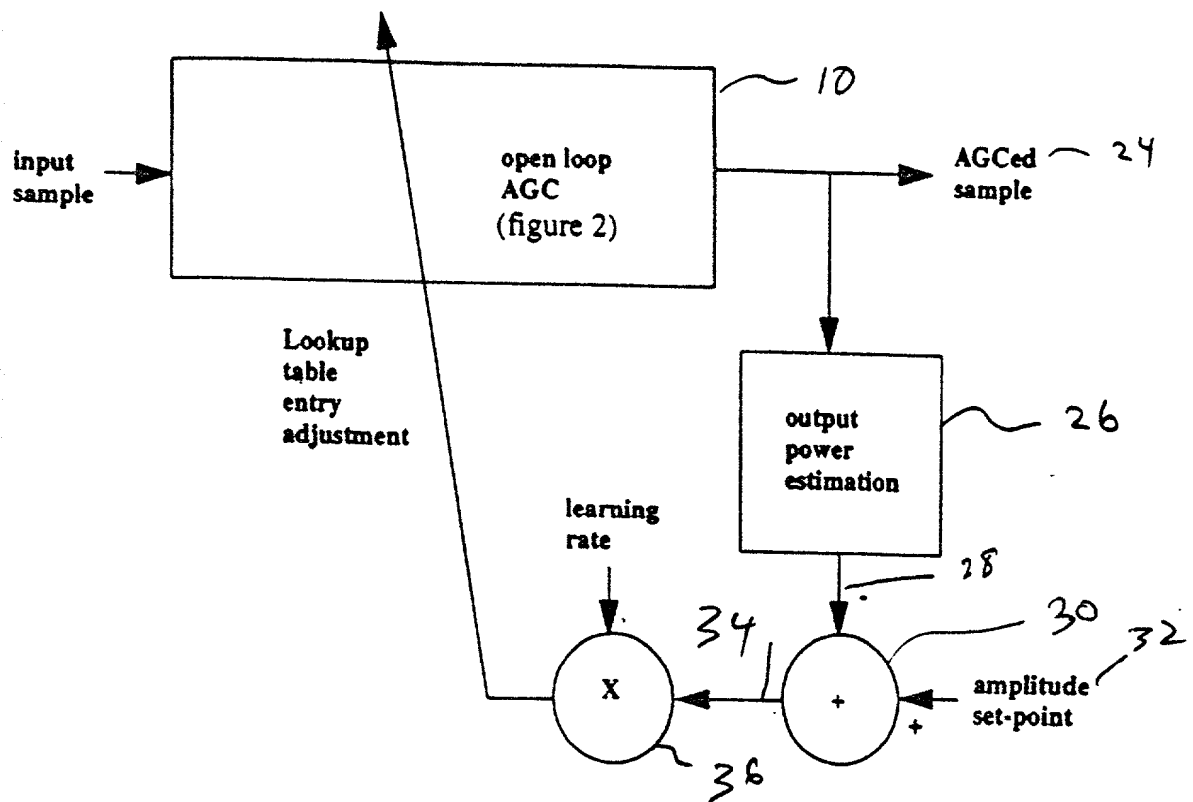
FIG 1.

Fig. Gain Table

FIG. 2

input
sample →

open loop
AGC
(figure 2)   ～ 10

→ AGCed ～ 24
   sample

Lookup
table
entry
adjustment

output
power
estimation   ～ 26

28

learning
rate

34   30   32

X   34   +   amplitude
                   set-point

36

Fig.4. Closed loop Table based AGC

F I G. 3

50

AGC executable
code in program
memory

gain table
in data memory

52

DSP

48

46

voice PCM

44   voice
     codec

42

analog voice

microphone

40
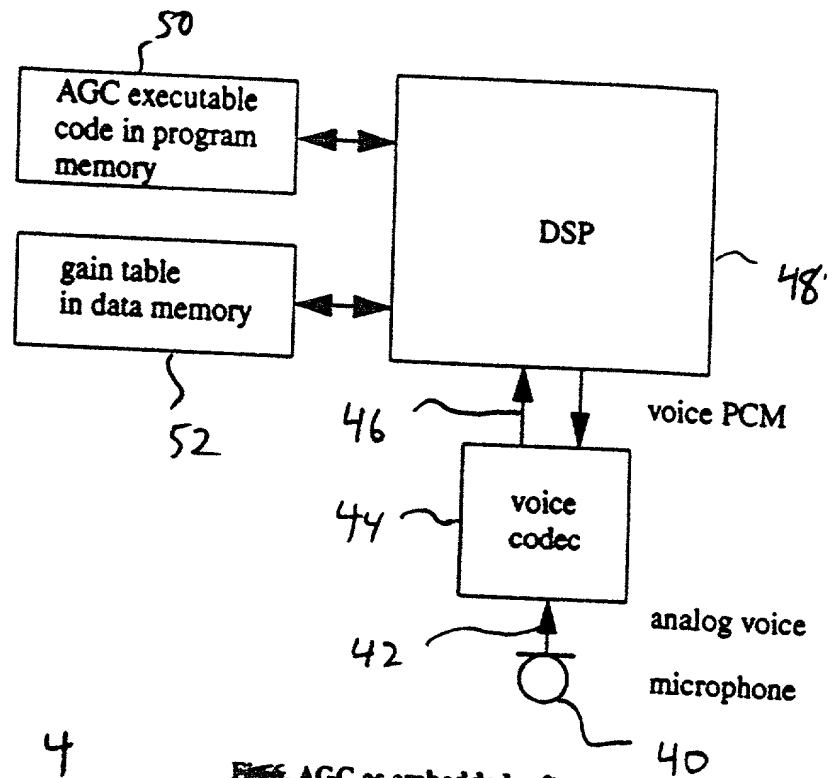
F I G. 4

Fig.6. AGC as embedded software

100

Determine
~~Estimate~~ Input Power — 110

Input Power <
THQUIET? — 112

gain = GNOISE — 114

Input Power <
THSAT? — 116

gain = GSAT — 118

Lookup gain
from table — 120

AGCed sample =
gain x input sample — 122

Determine
~~Estimate~~ Output Power — 124

error = Set point –
Output Power — 126

new gain = old gain +
beta * error — 128

FIG. 5

microphone
and
codec

62

68
address

absolute
value

64

single pole
IIR digital
filter

66

ram

70

88 +

+

data 72

+

X 74

76

absolute
value

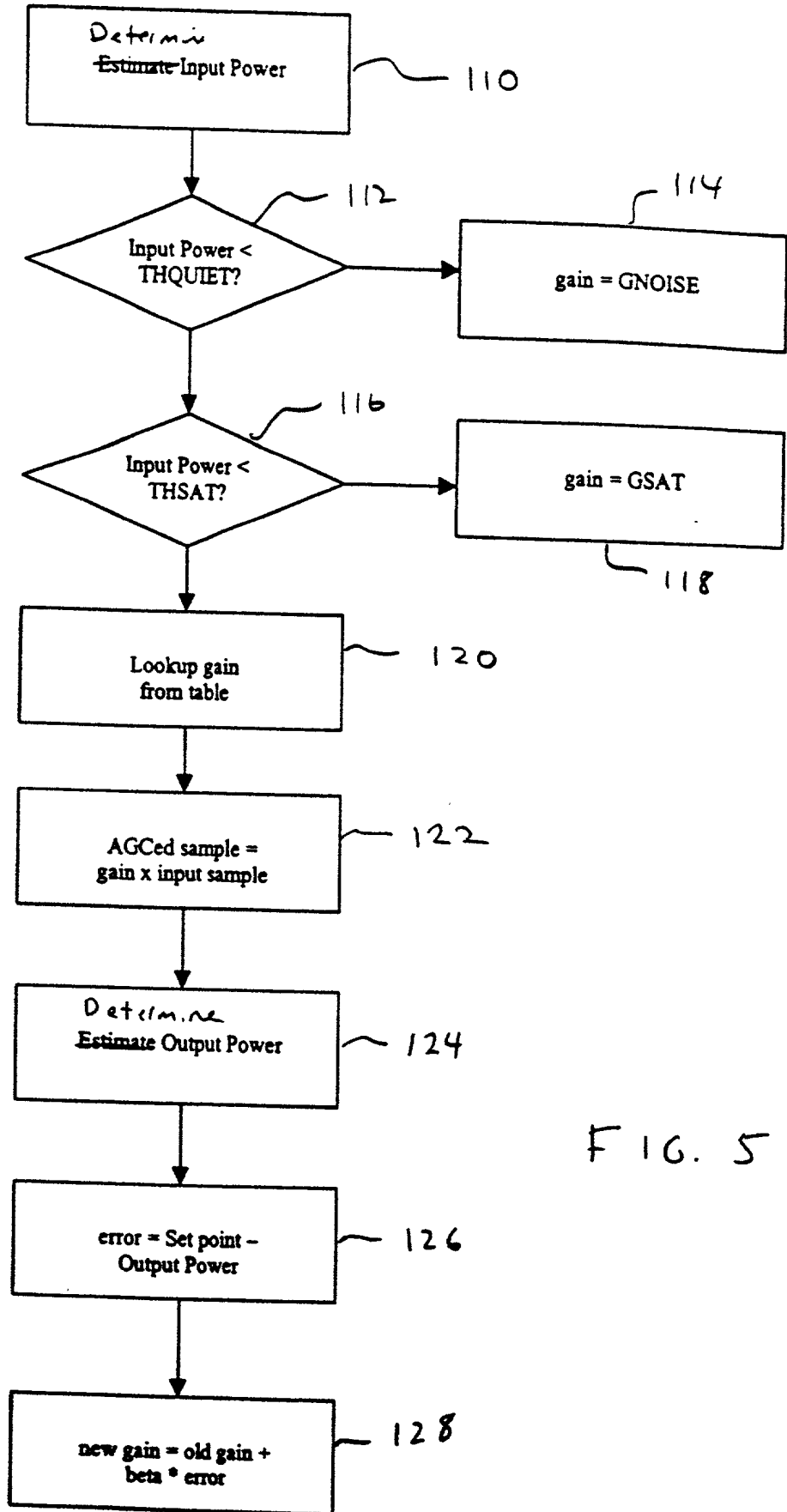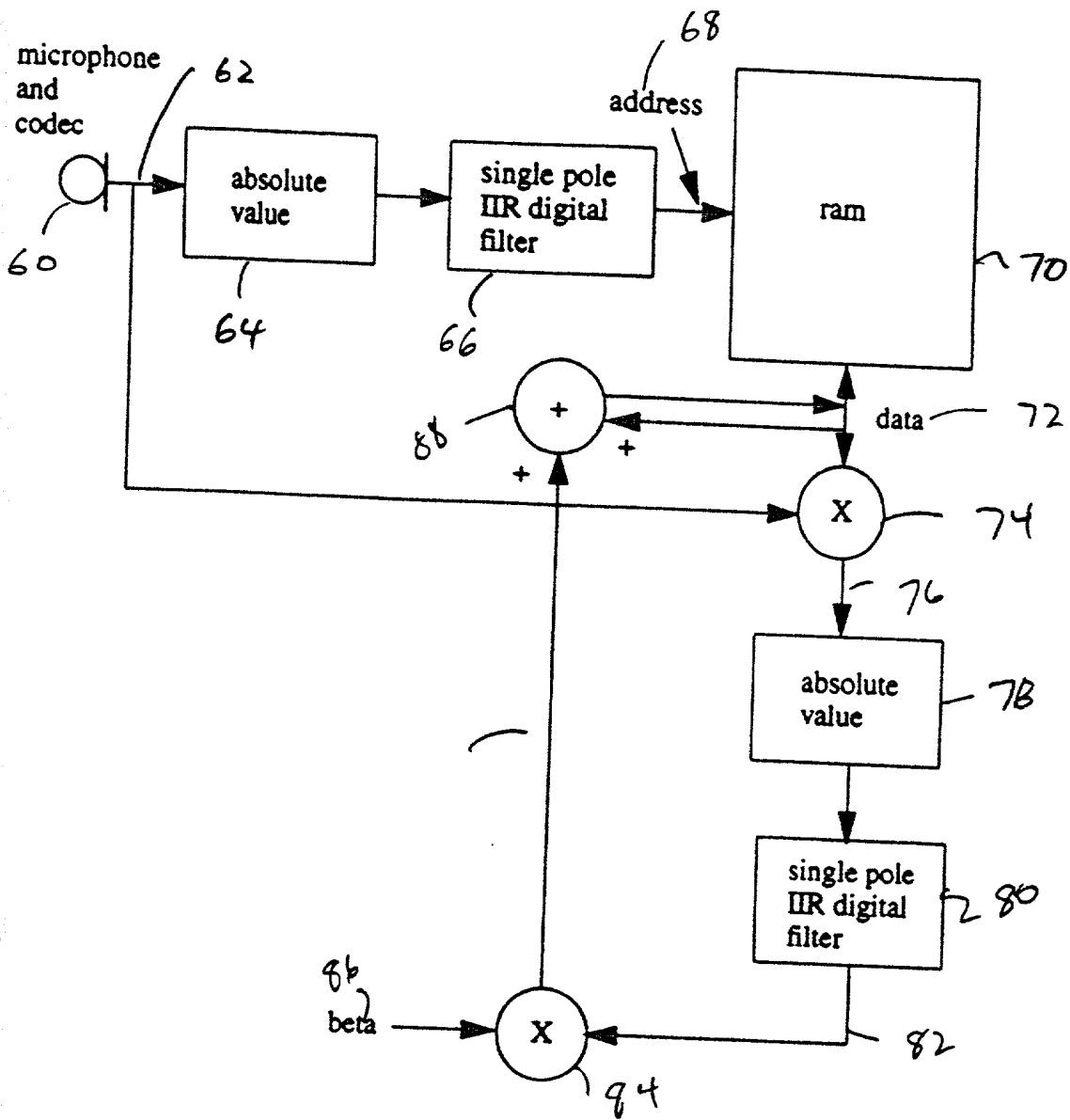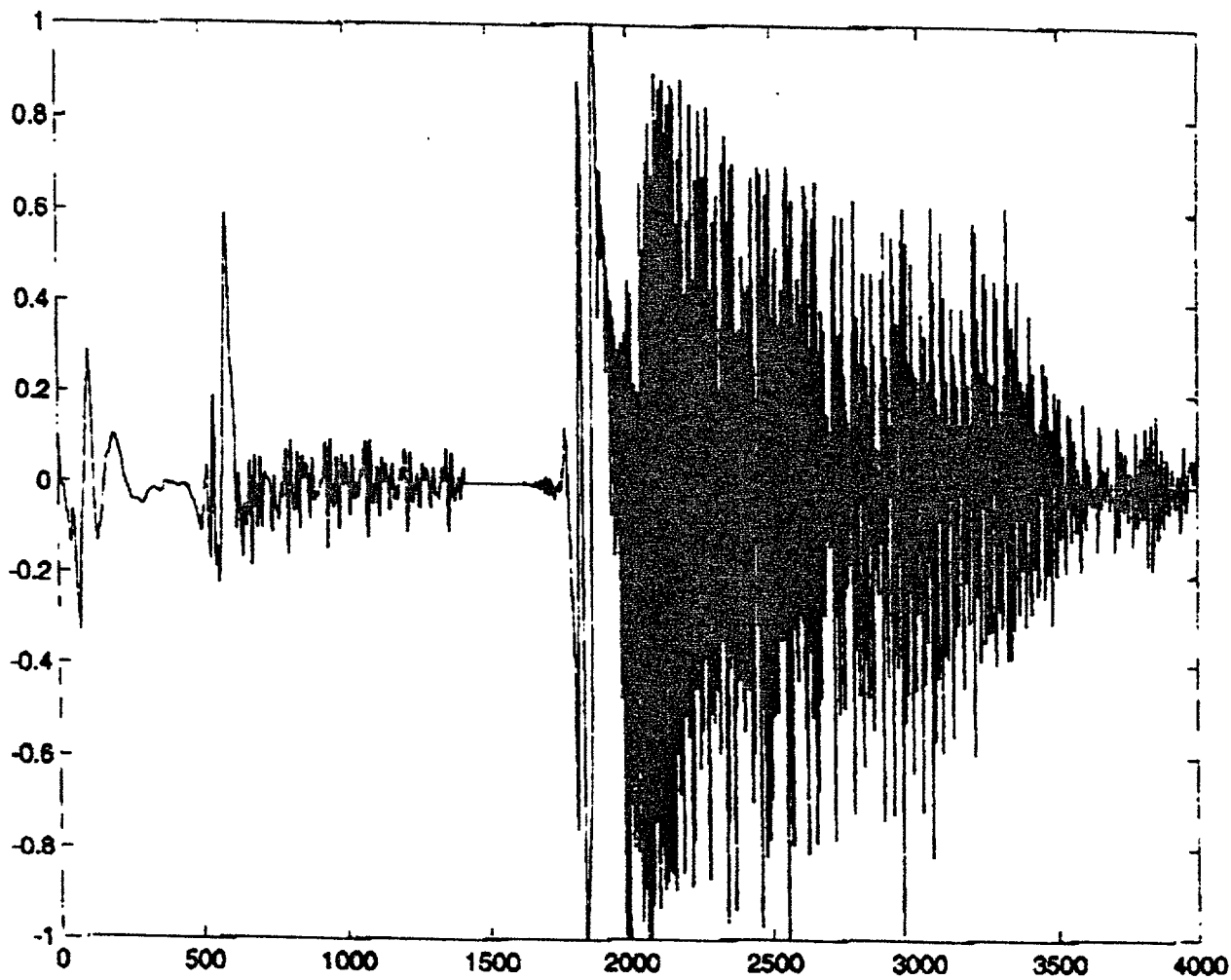78

single pole
IIR digital
filter

80

86
beta

X

82

94

Fig 7. AGC in hardware

F I G 6

Before ABC

Amplitude →

time →